niles audio

NILES AUDIO CORPORATION
RVS-6
INFRARED REMOTE SPEAKER SELECTOR
VOLUME CONTROLLER & INFRARED REPEATER
HOOKUP & OPERATING INSTRUCTIONS

INTRODUCTION

The RVS-6 is a speaker selection system that allows you to connect up to six pairs of speakers to a stereo receiver or amplifier. The unit incorporates many unique features:

- **Modular Design** - Inside the RVS-6 are six card slots. Each slot accepts an output card. Each output card provides an output for one pair of speakers. There are two different models of output cards available:

  RVC-1: A volume control card which functions as both a speaker on/off selector and a 12-position speaker-level volume control.

  RSS-1: A speaker on/off selector card without volume control.

  This modular system allows each RVS-6 to be configured as required. Most applications will require the RVC-1 cards; the RSS-1 cards are for those rooms where volume control is not desired.

- **Infrared Remote Control** - The RVS-6 has six IR sensor inputs, one for each remote room location. From any room equipped with a Niles IR sensor, you can turn the speakers in that room on or off, adjust the volume, or turn all the speakers on or off. All by wireless remote control. An IR sensor on the front of the RVS-6 is provided for controlling room one.

- **Built-In IR Repeater System** - Connect Niles IR flashers to the RVS-6 and most brands of remote-controllable equipment can be controlled from any room equipped with an IR sensor.

- **Teaches Learning Remotes Directly** - To aid in programming a learning remote, a special "teaching" flasher is located on the front of the RVS-6. The teaching flasher, when activated, sends the learning remote the IR commands necessary to operate the RVS-6.

- **Optional Dedicated Remote** - A remote dedicated to operating the RVS-6, the HC-2, is available.

- **True Automatic Impedance Protection** - A microprocessor in the RVS-6 keeps track of the number of speaker pairs playing. It protects the amplifier from low impedance loads by automatically adding the correct amount of impedance protection.

- **Optional X-10® Control Interface** - By adding the TW-523 interface, any wireless lighting controller using the X-10 standard can control the RVS-6. X-10 controllers transmit their commands directly over existing AC wiring. When plugged into an AC wall outlet, the TW-523 receives the X-10 commands and sends them to the RVS-6. This allows the RVS-6 to be controlled from any area not equipped with an IR sensor. The TW-523 and X-10 controllers are available from Niles.

INTRODUCTION (Con't)

- **Optional RP-6 Keypad Control** - When installed in a remote room location, the RP-6 keypad can be used to turn the speakers in that room on or off and adjust the volume. The speakers in all the rooms can be turned on or off by pressing the "all on" and "all off" buttons. The RP-6 is a single-gang Decora² style module and fits in a standard p-ring or electrical box. It connects to the RVS-6 using 2-conductor shielded cable.

- **Master/Slave Expansion Capability** - Multiple RVS-6's can be used in a "Master" configuration to accommodate systems larger than six rooms and in a "Slave" configuration to distribute surround-sound to multiple room locations.

  In a "Master" configuration, the first RVS-6 controls rooms one through six. The second unit controls rooms seven through twelve, and so on. When any room issues an "all on" or "all off" command, all the RVS-6's will respond to the command. An individual amplifier or receiver is required for each RVS-6.

  The "Slave" configuration is designed for distributing a surround-sound system to multiple rooms. The first RVS-6 slave can be used to distribute the rear channels, the second slave can distribute the center channel, and so on. The speaker on/off and volume settings of the slave units always "stay in sync" with each other. In addition, they follow the settings on the master unit.

  The RVS-6 units communicate with each other via special 4-conductor modular cords plugged into the UART connectors (see #6 UART Connector on Page 4).

  Refer to the section titled "UART MODE" on Page 6 for more information about Master/Slave configuration.

INSTALLATION CONSIDERATIONS

The RVS-6 should be located near the source components. It connects to the speaker-level output of an amplifier or receiver. Each remote room speaker is connected to the RVS-6 with an individual home run of speaker wire. For runs less than 30 feet, 18 gauge wire is sufficient. Use 16 gauge (or larger) for runs between 30-100 feet and 14 or 12 gauge for runs over 100 feet. The RVS-6 uses a wall-mount 110 volt to 12 volt DC power supply (included). Locate the amplifiers or receivers connected to the RVS-6 in an area with adequate ventilation.

The RVS-6 is designed for use with a receiver or amplifier having a maximum power output of 130 watts per channel. Damage caused by the use of a higher power receiver or amplifier will void the warranty.

Each remote IR sensor or RP-6 keypad is connected to the RVS-6 with an individual home run of 2-conductor shielded cable. Recommended IR cables are West Penn CL2-291, Belden 9462 or Carol C8162. These cables consist of two 22 gauge insulated wires and a bare drain (ground) wire; all three wires are surrounded by a foil shield. Cable of this type may be purchased from Niles Audio. DO NOT USE UNSHIELDED IR CABLE.
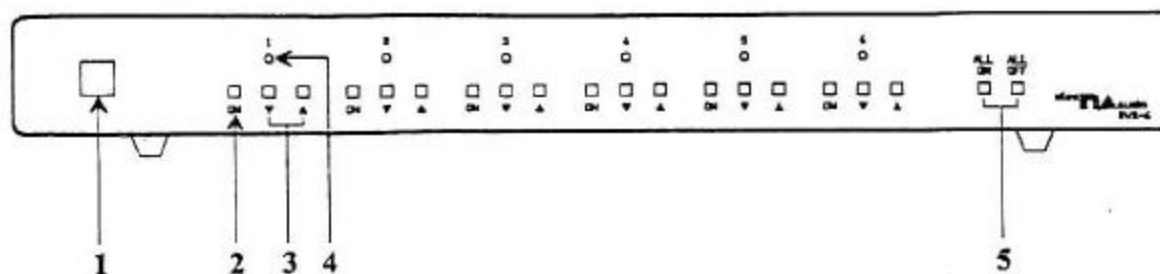
FEATURE DESCRIPTION

Figure 1

1. **Infrared Sensor / Teaching IR Flasher**

   Infrared sensor receives commands from the Niles HC-2 remote or a learning remote taught to work the RVS-6; also functions as a local IR repeater input. The teaching IR flasher is located behind the sensor window. It is used for programming a learning remote control. When activated, it sends out the IR commands necessary to operate the RVS-6.

2. **ON Button**

   Turns the speakers for that room on or off.

   Note: For rooms using RVC-1 cards: When the speakers are turned on using the ON button, the speakers will turn on at the last volume selected before they were turned off. The RVS-6 smoothly "ramps" the volume of the speakers up to the previous setting.

   The speakers may be turned on at zero volume by pressing the ▲ button.

3. **▼ and ▲ Buttons**

   Adjust the volume of the speakers for that room. The ▼ button lowers the volume and the ▲ button raises the volume. There are 12 possible volume settings. Step number 1 is "full off" and step number 12 is "full on". Step number 11 (one step down from "full on") provides -3 db of attenuation. Steps 10 through 4 reduce the volume in -3 db steps each, so step number 4 provides a total attenuation of -30 db. Steps 3 and 2 are -6 db steps; setting the volume to step number 2 provides the maximum possible attenuation of -42 db.

4. **Speakers On/Off Indicator**

   Indicates on/off status of the speakers for that room.

   Note: For rooms using RVC-1 cards: If the ▼ button is used to turn off a room's speakers, the LED for that room will remain lit. This indicates that the speakers are selected but that the volume is set to step 1 (full off).

5. **All On / All Off**

   Turns all the speakers on or off.

   Note: All the speakers will turn on at the last volume selected, or at the factory default volume setting of step number 3, depending on the setting of the "ALL ON VOLUME" switch on the bottom of the RVS-6. In addition, the "ALL ON ROOMS" switches can be set to selectively disable rooms 1-6 from responding to the "ALL ON" command. Refer to the section titled "ALL ON ROOMS and ALL ON VOLUME" on Page 9 for more information.
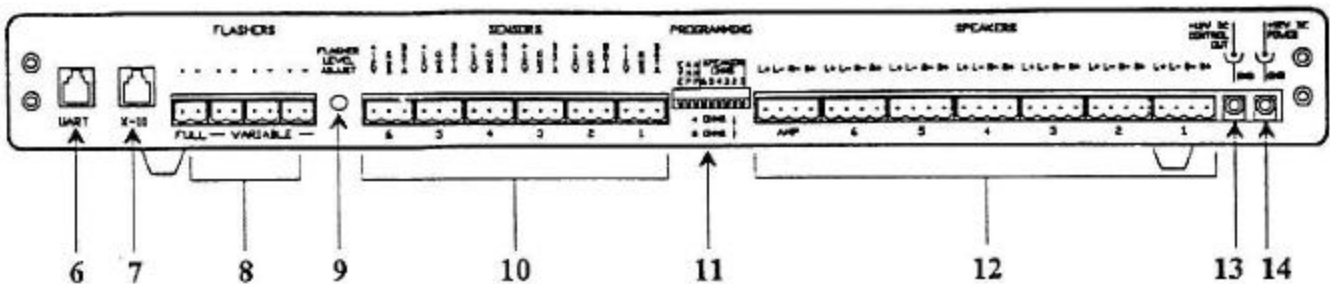
FEATURE DESCRIPTION (Con't)

Figure 2

6. **UART Connector**

This is a communications port. It connects to other Niles products; it allows multiple RVS-6's to be connected for master and/or slave configurations. Uses a <u>special</u> 4-conductor cord available from Niles (order part # CA00025). Do not use standard phone cords for this connection. Refer to Figures 3 and 4 on Pages 6 and 7 for more information.

7. **X-10 Interface Connector**

Connects to optional TW-523 interface (available from Niles). Allows X-10 lighting controllers to be used to operate the RVS-6. Uses standard RJ-14 4-conductor modular phone cord (included with TW-523). For more information on X-10, refer to Page 1, Page 9, and Page 12, Figure 9.

8. **Flasher Output**

Provided for using the IR repeating system built-in the RVS-6. Any model of the Niles IR Flashers can be connected to these outputs. The IR sensors connected to the RVS-6 will function as an IR repeater for most manufacturer's remote controls. The flasher connector labeled FULL is a high-power output. The flasher connectors labeled VARIABLE have adjustable output strength.

9. **Flasher Level Adjust**

Adjusts the output strength of the flashers connected to the VARIABLE outputs. For maximum IR output, turn the control fully clockwise. For less output, turn it counter-clockwise.

Note: Some equipment can be overloaded by too much IR. If erratic equipment operation is experienced, turn the FLASHER LEVEL ADJUST counter-clockwise until reliable operation is achieved.

10. **Sensor Inputs**

Individual inputs for 6 Niles IR remote sensors. Each IR sensor is connected with an individual home run of 2-conductor shielded cable. Recommended IR cables are: West Penn CL2-291, Belden 9462 or Carol C8162. These cables consist of two 22 gauge insulated wires (for carrying the 12 volts and data) and a <u>bare</u> drain (ground) wire; all three wires are surrounded by a foil shield. Cable of this type may be purchased from Niles. DO NOT USE UN-SHIELDED IR CABLE.

INSTALLATION GUIDELINES FOR INFRARED SYSTEMS:

* Use "home runs" of shielded cable for all IR sensors.

* Do not locate IR sensors near lighting system controls (dimmers), electrical or electronic devices.

* Avoid locating IR sensors in areas with lots of sunlight, ambient or direct.

* Avoid locating an IR sensor in the same room as a flasher. If you must, use the Niles IRC-2 flashers and cover them with the supplied blockers. This will prevent optical feedback.

FEATURE DESCRIPTION (Con't)

11. DIP Switches (Rear Panel)

These DIP switches are used for setting the following parameters:

EYE

Disables the IR sensor on the front of the RVS-6. The IR sensor on the front of the RVS-6 must be disabled if:

- There is a remote IR sensor connected to SENSOR INPUT #1
- The RVS-6 is located where its sensor will pickup a flasher's IR output (optical feedback)

The front-panel IR sensor is disabled by moving the DIP switch under the word EYE to the down position.

AMP

The RVS-6 will automatically protect the amplifier or receiver connected to it from low impedance loads. To perform this function correctly, the AMP switches must be set accordingly:

Minimum Load Recommended By Amplifier/Receiver Manufacturer	AMP -1 Switch Setting	AMP - 2 Switch Setting
8 OHMS	UP	UP
4 OHMS	UP	DOWN
2 OHMS	DOWN	UP
1 OHM or LESS*	DOWN	DOWN

Rear View of RVS-6

PROGRAMMING

A A
M M
P P

1 2
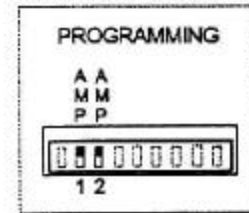
*In this setting, the RVS-6 automatic protection function is disabled. In this mode, the lowest possible impedance that will be presented to the amplifier is .67 Ohms (6 pairs of 4 Ohm speakers connected, all speakers turned on, all volume controls set to full on).

SPEAKER OHMS

The RVS-6 calculates the amount of impedance protection needed according to the number of speaker pairs playing. To function correctly, the SPEAKER OHMS switches 1-6 must be set accordingly:

If the room's speaker pair impedance is:	Set the SPEAKER OHMS switch for that room:
8 Ohms or higher	DOWN
6 Ohms	UP
4 Ohms	UP
Less than 4 Ohms	UP

Rear View of RVS-6

PROGRAMMING

SPEAKER
OHMS
6 5 4 3 2 1
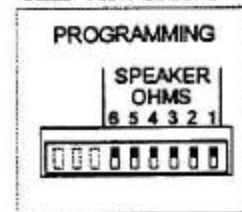
12. Amplifier Input and Speaker Connections

Connect the AMP connector to the speaker-level output of an amplifier or receiver. If the amplifier or receiver has "A" and "B" speaker outputs, connect the RVS-6 to output "A". DO NOT CONNECT ANYTHING TO THE "B" OUTPUT.

Be sure that proper polarity is observed when connecting the speakers.

FEATURE DESCRIPTION (Con't)

13. 12 Volt DC Control Out

12 volts is present at this output whenever any room is turned on. Provided as an interface for controlling other Niles switching devices such as the AC-3 Voltage-Activated AC Outlet, SPK-1 Speaker A-B Switch, etc.

Note: The 12 volt DC Control Out can supply a maximum current of 200 milliamps (.2 Amp). DO NOT EXCEED THIS LIMIT.

14. 12 Volt DC Power Jack

Connects to a wall-mount 110 volt to 12 volt DC power supply (included). DO NOT SUBSTITUTE OTHER POWER SUPPLIES.

SETTING THE BOTTOM PANEL DIP SWITCHES

The DIP switches on the bottom of the RVS-6 set the following parameters:

UART MODE

This is the top row of dip switches. They must be set when multiple RVS-6's are connected in a Master/Slave configuration.

The Master configuration links multiple RVS-6's together so they can communicate with each other. For example, in a system using two RVS-6's, they can be linked so that when any room issues an "all on" or "all off" command, both RVS-6's will respond to the command.

Up to eight RVS-6's may be linked in this manner. The following diagram illustrates the RVS-6 Master configuration:
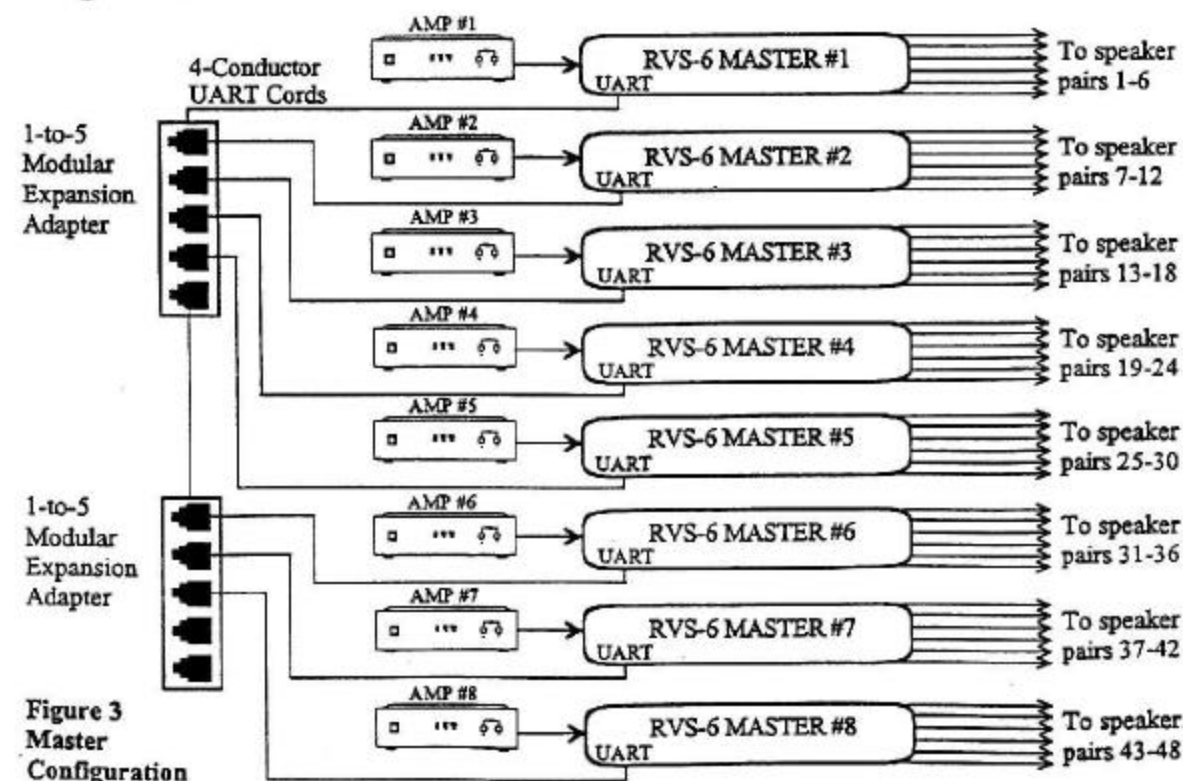

Figure 3
Master
Configuration

SETTING THE BOTTOM PANEL DIP SWITCHES

UART MODE (Con't)

The Master/Slave configuration is used for distributing a surround-sound system to multiple rooms. The first RVS-6 slave can be used to distribute the center channel, the second slave can distribute the rear channels, and so on. The speaker on/off and volume settings of the slave units always "stay in sync" with each other. In addition, they follow the settings on the master unit.
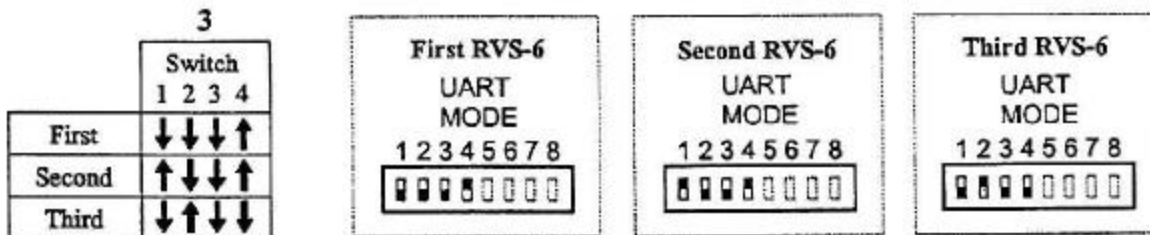
UART dip switches 1-4 are used for identifying the total number of RVS-6 "Masters". How the switches will be set on each unit depends on the total number of RVS-6's being used. Use the following chart to set the switches.

1. Find the column under TOTAL NUMBER OF RVS-6's that matches the number of units being used.
2. Set the UART Switches 1-4 on each RVS-6 to match the settings shown below.

TOTAL NUMBER OF RVS-6's BEING USED

		1	2	3	4	5	6	7	8
		Switch 1 2 3 4	Switch 1 2 3 4	Switch 1 2 3 4	Switch 1 2 3 4	Switch 1 2 3 4	Switch 1 2 3 4	Switch 1 2 3 4	Switch 1 2 3 4
Dip Switch Settings For Each RVS-6	First	↓↓↓↓	↓↓↓↑	↓↓↓↑	↓↓↓↑	↓↓↓↑	↓↓↓↑	↓↓↓↑	↓↓↓↑
	Second		↑↓↓↓	↑↓↓↑	↑↓↓↑	↑↓↓↑	↑↓↓↑	↑↓↓↑	↑↓↓↑
	Third			↓↑↓↓	↓↑↓↑	↓↑↓↑	↓↑↓↑	↓↑↓↑	↓↑↓↑
	Fourth				↑↑↓↓	↑↑↓↑	↑↑↓↑	↑↑↓↑	↑↑↓↑
	Fifth					↓↓↑↓	↓↓↑↑	↓↓↑↑	↓↓↑↑
	Sixth						↑↓↑↓	↑↓↑↑	↑↓↑↑
	Seventh							↓↑↑↓	↓↑↑↑
	Eighth								↑↑↑↓

For example, if you are using 3 RVS-6's, you would set switches 1-4 on each unit accordingly:

3

	Switch 1 2 3 4
First	↓↓↓↑
Second	↑↓↓↑
Third	↓↑↓↓

First RVS-6	Second RVS-6	Third RVS-6
UART MODE	UART MODE	UART MODE
1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8

UART switches 5-8 are used for identifying the total number of "Slave" units. Each Master RVS-6 may have a maximum of 3 Slaves assigned to it. Use the following chart to set the switches.

SETTING THE BOTTOM PANEL DIP SWITCHES (Con't)

STARTING X-10 ADDRESS

This is the middle row of DIP switches.

X-10 lighting control transmitters identify themselves by sending out a specific "House Code" followed by a "Unit Code". There are 16 House Codes which are represented by the letters A-P; the Unit Codes are represented by the numbers 1-16. This coding method allows each X-10 transmitter to be assigned to control a specific light or appliance in a house. For example, House Code group "A" might be for the outside lights, group "B" for the inside lights, group "C" for the appliances, etc. Each House Code group can support up to 16 units, which are the Unit Codes. Using the previous example, an X-10 transmitter set to code "A-1" would control the first outside light.

The "Starting X-10 Address" switches on the RVS-6 set the House Code and Unit Codes that the RVS-6 will respond to. This allows other X-10 devices which are controlling the lights, appliances, etc. to be used without conflict.

Set the RVS-6 House Code to any letter not being used; the Unit Code you set will be for the first pair of speakers. The RVS-6 automatically dedicates the next 5 Unit Codes for the rest of the speakers, so if starting address "A-1" is chosen, the RVS-6 will assign "A-2" for the second pair of speakers, "A-3" for the third, and so on.

Set the X-10 control transmitters to the corresponding House and Unit codes according to the manufacturer's instructions.

Refer to Figure 9 on Page 12 for the RVS-6 X-10 Interface connections.

ALL ON ROOMS and ALL ON VOLUME

This is the bottom row of DIP switches.

Switches 1-6 can be set to selectively disable rooms 1-6 from responding to the "ALL ON" command. For example, if switch 2 is set to the DISABLE position, and the other switches are left in the ENABLED position, all the rooms will respond to the "ALL ON" command except for room 2, which will remain off. This feature is particularly useful for installations having outdoor speakers.

The last DIP switch in this row, number 7, determines the turn-on volume of the speakers when an "ALL ON" command is issued. When this switch is set to the DEFAULT position, the speakers will turn on at volume step number 3. In the LAST VOL position, the speakers will turn on at the last volume selected before they were turned off.

HOUSE CODE	SWITCH 1 2 3 4
A	↓ ↓ ↓ ↓
B	↓ ↓ ↓ ↑
C	↓ ↓ ↑ ↓
D	↓ ↓ ↑ ↑
E	↓ ↑ ↓ ↓
F	↓ ↑ ↓ ↑
G	↓ ↑ ↑ ↓
H	↓ ↑ ↑ ↑
I	↑ ↓ ↓ ↓
J	↑ ↓ ↓ ↑
K	↑ ↓ ↑ ↓
L	↑ ↓ ↑ ↑
M	↑ ↑ ↓ ↓
N	↑ ↑ ↓ ↑
O	↑ ↑ ↑ ↓
P	↑ ↑ ↑ ↑

UART MODE
1 2 3 4 5 6 7 8

1 2 3 4 | 5 6 7 8

'ALL ON'
ROOMS 1-6
↑ = ENABLED
↓ = DISABLED

1 2 3 4 5 6 | 7

'ALL ON'
VOLUME
↑ = DEFAULT
↓ = LAST VOL

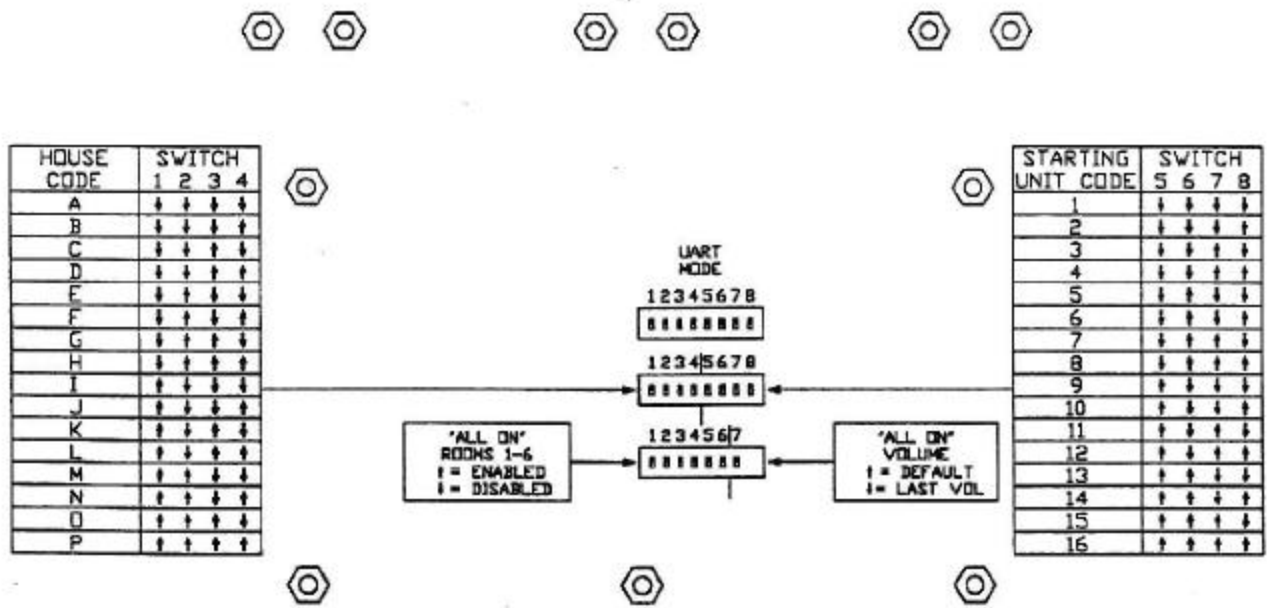| STARTING UNIT CODE	SWITCH 5 6 7 8
1	↓ ↓ ↓ ↓
2	↓ ↓ ↓ ↑
3	↓ ↓ ↑ ↓
4	↓ ↓ ↑ ↑
5	↓ ↑ ↓ ↓
6	↓ ↑ ↓ ↑
7	↓ ↑ ↑ ↓
8	↓ ↑ ↑ ↑
9	↑ ↓ ↓ ↓
10	↑ ↓ ↓ ↑
11	↑ ↓ ↑ ↓
12	↑ ↓ ↑ ↑
13	↑ ↑ ↓ ↓
14	↑ ↑ ↓ ↑
15	↑ ↑ ↑ ↓
16	↑ ↑ ↑ ↑

Figure 5
Bottom view of RVS-6

INSTALLING THE OUTPUT CARDS

The RVC-1 and RSS-1 output cards are sold separately. The appropriate type and number of cards must be installed prior to using the RVS-6.

1. Remove the screws from the sides and top of the unit and lift up the cover.

2. There are six card slots inside the RVS-6. As viewed from the front of the unit, the first slot on the left is for room number 1, the next slot on the right is for room number 2, and so on.

3. Install the RVC-1 and/or RSS-1 cards in the appropriate slots. Refer to figure 6 below.

4. Place the cover back onto the unit and replace the screws.

   Note: Always unplug the RVS-6 power supply before installing or removing any cards.
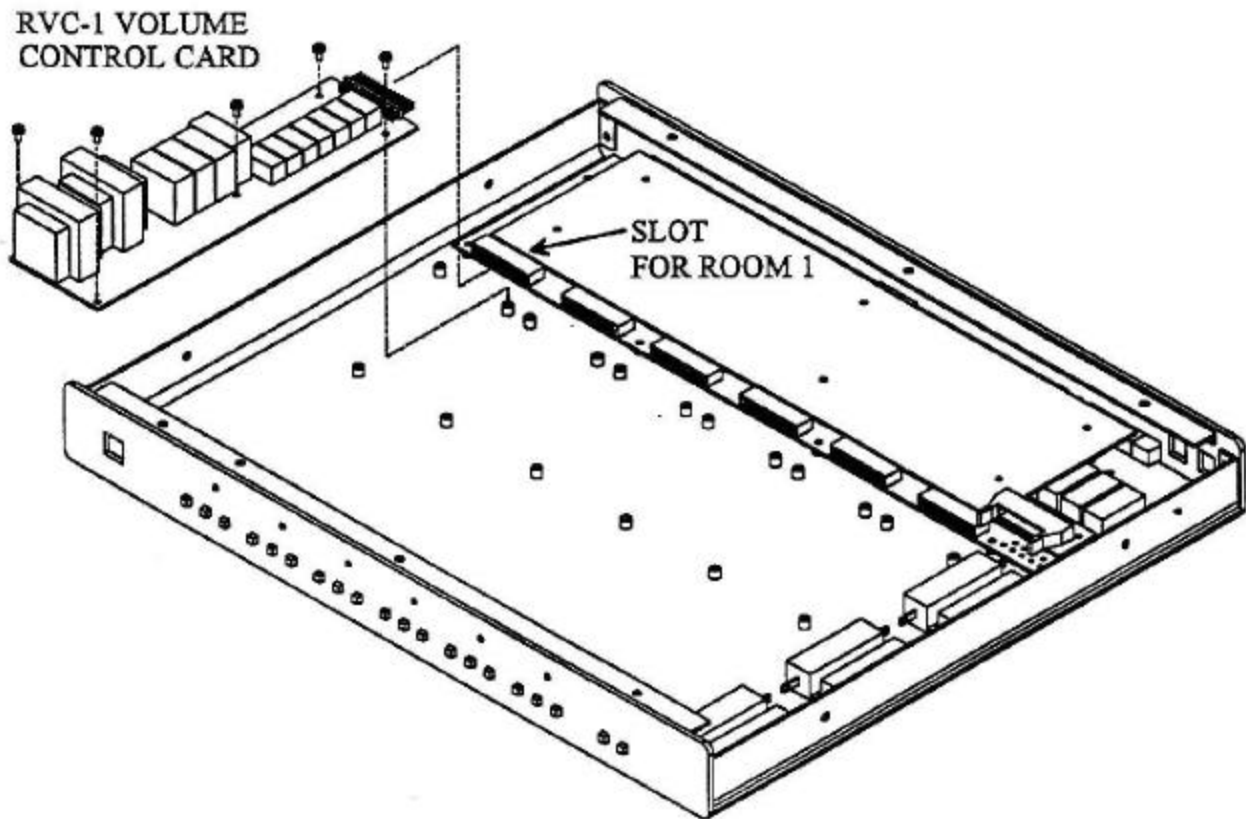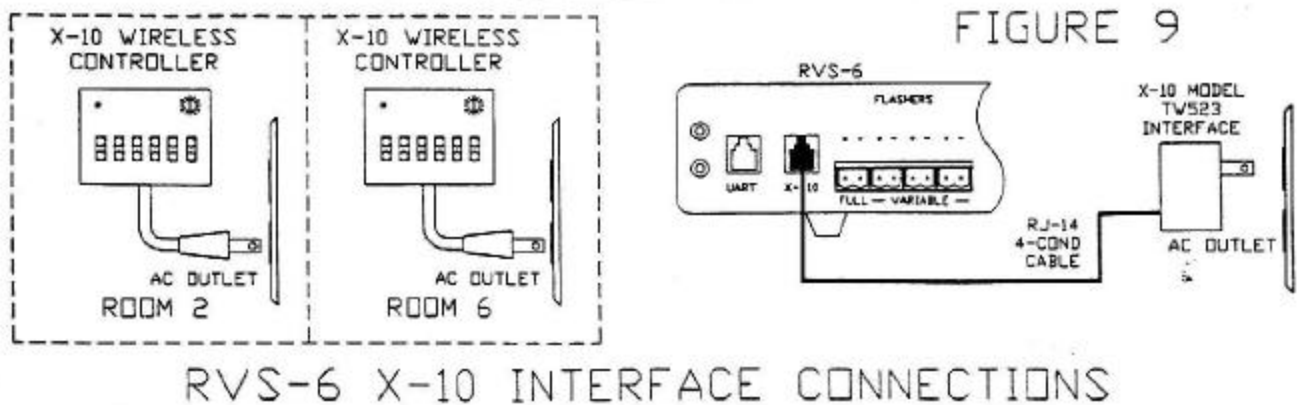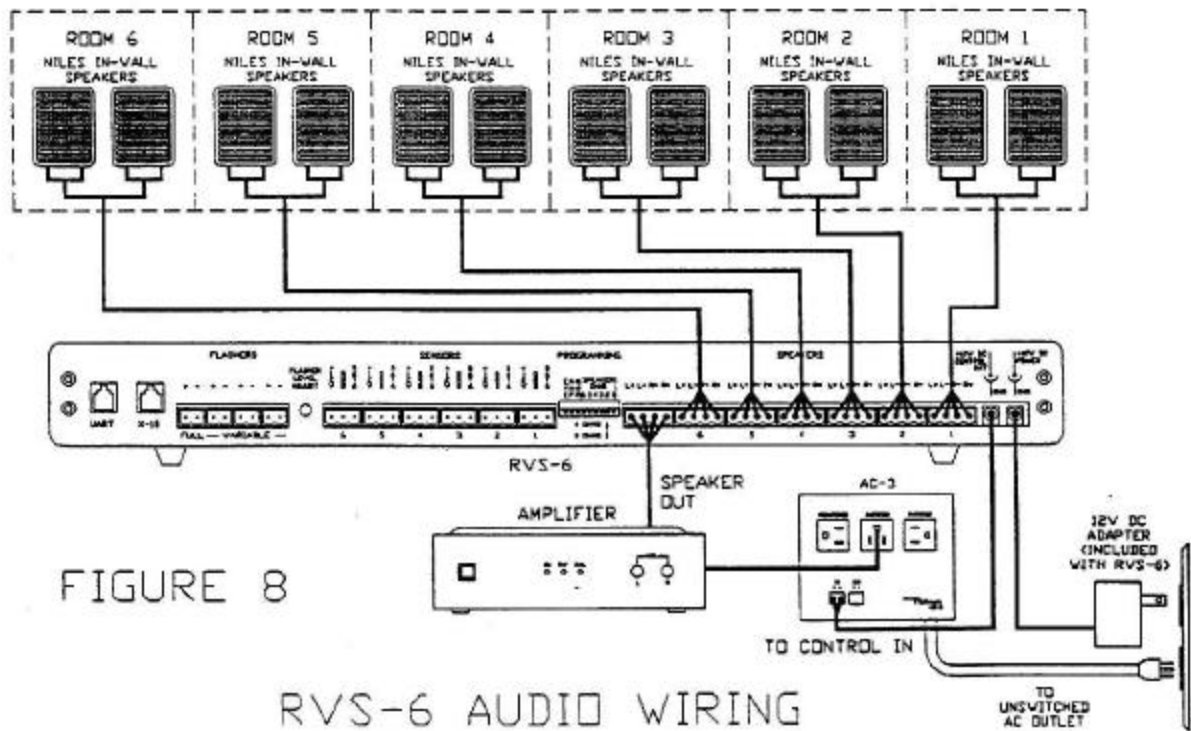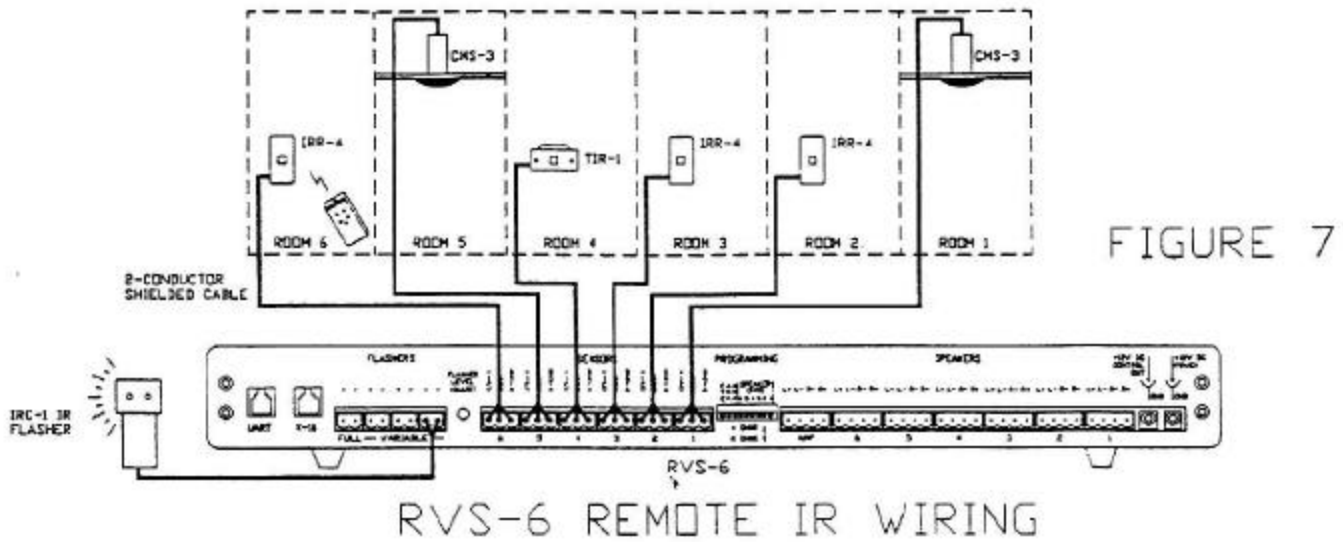
RVC-1 VOLUME
CONTROL CARD

SLOT
FOR ROOM 1

Figure 6

CONNECTIONS

FIGURE 7

RVS-6 REMOTE IR WIRING

FIGURE 8

RVS-6 AUDIO WIRING

FIGURE 9

RVS-6 X-10 INTERFACE CONNECTIONS

TEACHING A "LEARNING" REMOTE TO OPERATE THE RVS-6

Any learning-type remote control can be programmed to operate the RVS-6. The HC-2 remote is not required for this since the RVS-6 is capable of programming learning remotes directly. A special "teaching" flasher, located behind the IR sensor window on the front of the RVS-6, is used for the programming. This flasher sends out the IR codes needed to operate the RVS-6 by remote control.

Before you can program a learning remote to operate the RVS-6, you must first put the RVS-6 in the "PROGRAMMING" mode.

1. Simultaneously press and continue to hold the ▼ buttons for Room 1 and Room 2 on the front of the RVS-6 for at least 1 second. Once in the PROGRAMMING mode, LED number 1 will light, indicating that the first IR command is ready to be sent. Release both ▼ buttons.

2. Align the "learning end" (sensor input) of the learning remote directly in front of the RVS-6's teaching IR flasher. Make sure they are no further than three inches away (see Figure 8 on Page 14).

3. There are five IR commands which need to be taught to the learning remote. The commands are:

   SPEAKERS ON/OFF
   VOLUME UP
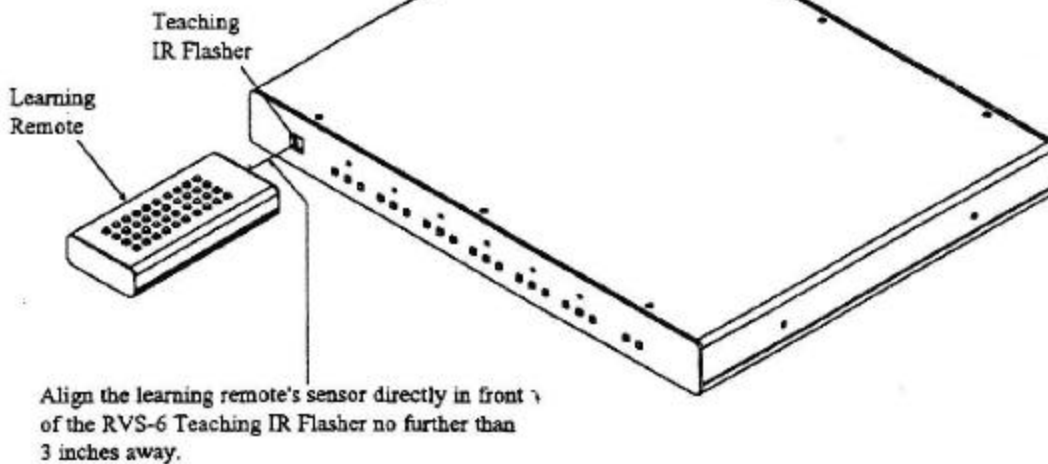   VOLUME DOWN
   ALL SPEAKERS ON
   ALL SPEAKERS OFF

   Choose 5 buttons on the learning remote to store these commands.

4. Put the learning remote into the "learn" mode according to its manufacturers' instructions. Review the instructions for the steps required to program the learning remote. Usually, you press a button on the learning remote first, then you press a matching button on the teaching remote. Most learning remotes will prompt you with an LED labeled "other" or "learn" when they are ready to receive a command from the teaching remote.

5. Press the button on the learning remote chosen to store the desired RVS-6 command.

6. When you see the "other" or "learn" prompt on the learning remote, press the ON button for Room 1 on the RVS-6. This transmits the IR command from the RVS-6 to the learning remote.

7. Press the ▲ button for Room 1 on the RVS-6 to advance to the next IR command to be sent to the learning remote. LEDs 1 through 5 on the RVS-6 display which IR command is ready to be transmitted. You can keep track of which command is ready to be sent by observing the LED's:

When this LED is lit:	This IR command is ready to be sent:
LED 1	SPEAKER ON/OFF
LED 2	VOLUME UP
LED 3	VOLUME DOWN
LED 4	ALL SPEAKERS ON
LED 5	ALL SPEAKERS OFF

8. Repeat steps 5 through 8 until all the desired IR commands have been learned.

9. To exit the PROGRAMMING mode and return to normal operation, press the ▼ button for Room 2 on the RVS-6.

Figure 8

Teaching
IR Flasher

Learning
Remote

Align the learning remote's sensor directly in front ￵
of the RVS-6 Teaching IR Flasher no further than
3 inches away.

OPERATION

1. Turn on the source equipment. With the amplifier or receiver volume set at minimum, press the ON buttons on the RVS-6 corresponding to the speaker pairs you wish to play.

2. For those rooms using RVC-1 cards, depress the ▲ button for each speaker pair until the volume is eight steps up from the minimum. An audible "click" will be heard from the RVS-6 for each step.

3. Slowly turn up the amplifier or receiver volume and set it to a comfortable (not maximum) listening level.

4. For rooms using RVC-1 cards, adjust the volume of the speaker pairs by pressing the ▼ and ▲ buttons.

5. To turn off the speakers press the ON button again. All the speakers may be turned on or off by pressing the ALL ON and ALL OFF buttons.

   Note: For rooms using RVC-1 cards: When the speakers are turned on using the ON button, the speakers will turn on at the last volume selected before they were turned off. The RVS-6 smoothly "ramps" the volume of the speakers up to the previous setting.

   The speakers may be turned on at zero volume by pressing the ▲ button.

RVS-6 SPECIFICATIONS

Maximum Input Power Handling	130 watts per channel
Mounting	Table-top component
Wiring Requirements	Individual home-runs of speaker wires and 2-conductor shielded IR cables
Speaker Wire Capacity	14 gauge
Power Requirements	Powered by 110v AC to 12v DC adapter (provided)
Overall Dimensions (including connectors)	17" Wide x 2 3/16" High x 14 1/4" Deep
Weight	Without cards, 6 lbs. With 6 RVC-1 cards installed, 12 lbs.